Remarks

Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-66 are now pending in this application. Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 are rejected. Claim 66 has been newly added. Claims 1, 31, 54 and 58 have been amended. No new matter has been added. No fees are due for the newly added claim.

The rejection of Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 under 35 U.S.C. § 103(a) as being unpatentable over Bessler et al. (U.S. Patent No. 5,410,230), in view of Alford (U.S. Patent No. 5,220,255) and Kliman et al. (U.S. Patent No. 6,262,550) is respectfully traversed.

Bessler et al. describe an electronically commutated motor (ECM) (310) that constitutes a variable speed motor responsive to a motor control signal provided by microprocessor (302) via a line (308) for driving various portions of a system in response to the motor control signal (column 6, lines 7-11). The microprocessor constitutes control means responsive to the temperature signal on a bus (204) provided by a thermostat (202) (column 6, lines 11-13). The microprocessor receives the temperature signal and monitors the cyclic parameter of the temperature signal to generate the motor control signal provided via the line as a function of the monitored cyclic parameter (column 6, lines 13-17). The control signal provided via the line is provided to the ECM as a motor control signal to control the torque or speed of the motor (column 6, lines 18-20).

Alford describes an interface for operatively interconnecting a conventional thermostat and an electronically commutated motor ("ECM") (abstract). The interface provides enable, heating and rate signals to the ECM in response to conventional fan, heat, valve and airflow signals from the thermostat (abstract).

Kliman et al. describe a pair of monitoring units (12, 14) that are connected by a communication link (20), which may be a high-speed bus that is a hard-wired Ethernet network or a wireless path, such as a radio or optical local-area-network (LAN) (column 5, lines 16-21). Each of the monitoring units includes a central processor unit (column 5, lines 45-50). The monitoring unit (12) acquires data signals from a Stimulus and Measurement

Instrumentation unit (22), which in turn captures signals from sensors that are in contact with a motor or in an immediate vicinity of the motor (column 6, lines 19-24).

Claim 1 recites a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, the method comprising the steps of "coupling the motor control circuit directly to the electric motor, wherein the motor control circuit is separate from the controller; adjusting a level of a first signal received from the controller that is separate from a thermostat configured to communicate a temperature to the controller; converting, by the interface circuit, the first signal received from the controller to generate a second signal including at least one of an infrared signal and a radio frequency (RF) signal, wherein the controller is coupled via the interface circuit to a microcontroller located within the electric motor; outputting the second signal to control the electric motor; receiving, by the motor control circuit, a third signal from the electric motor; and transmitting the third signal from the electric motor to the controller."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest a method for interfacing an electric motor to a controller as recited in Claim 1. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest converting, by the interface circuit, the first signal received from the controller to generate a second signal including at least one of an infrared signal and a radio frequency (RF) signal, where the controller is coupled via the interface circuit to a microcontroller located within the electric motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal. Bessler et al. further describe monitoring, by the microprocessor, a cyclic parameter of the temperature signal to generate a motor control signal. Bessler et al. also describe providing the control signal via a line to an ECM. Accordingly, Bessler does not describe or suggest converting the first signal received from the controller to generate a second signal including at least one of an infrared signal and a radio frequency signal. Alford describes providing, by an interface, enable, heating and rate signals to an ECM in response to conventional fan, heat, valve and airflow signals from a thermostat. Accordingly, Alford does not describe or suggest converting the first signal received from the controller to generate a second signal including at least one of an infrared

signal and a radio frequency signal. Kliman et al. describe acquiring, by a monitoring unit, data signals from a Stimulus and Measurement Instrumentation unit, which in turn captures signals from sensors that are in contact with a motor. Accordingly, Kliman et al. does not describe or suggest the controller that is coupled via the interface circuit to a microcontroller located within the electric motor, where the interface circuit converts the first signal received from the controller to generate a second signal including at least one of an infrared signal and a radio frequency signal. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests converting as recited in Claim 1. For the reasons set forth above, Claim 1 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 2 and 4-11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2 and 4-11 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 4-11 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 31 recites an electrical interface circuit comprising "a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, said electrical interface circuit further configured to convert a voltage signal to at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electric motor; and a motor control interface circuit directly coupled to said electric motor and coupled to said controller interface circuit, said motor control interface circuit comprising a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals generated by said electric motor."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit as recited in Claim 31. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest the electrical interface circuit further configured to convert a voltage signal to at least one of an infrared signal and an RF signal, the controller coupled via the electrical interface circuit to a microcontroller located within an electric motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal. Bessler et al. further describe monitoring, by the microprocessor, a cyclic parameter of the temperature signal to generate a motor control signal. Bessler et al. also describe providing the control signal via a line to an

ECM. Accordingly, Bessler does not describe or suggest the electrical interface circuit further configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Alford describes providing, by an interface, enable, heating and rate signals to an ECM in response to conventional fan, heat, valve and airflow signals from a thermostat. Accordingly, Alford does not describe or suggest the electrical interface circuit further configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Kliman et al. describe acquiring, by a monitoring unit, data signals from a Stimulus and Measurement Instrumentation unit, which in turn captures signals from sensors that are in contact with a motor. Accordingly, Kliman et al. does not describe or suggest the controller coupled via the electrical interface circuit to a microcontroller located within an electric motor, the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit as recited in Claim 31. For the reasons set forth above, Claim 31 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 32-44 and 46-48 depend, directly or indirectly, from independent Claim 31. When the recitations of Claims 32-44 and 46-48 are considered in combination with the recitations of Claim 31, Applicants submit that dependent Claims 32-44 and 46-48 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 54 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising "a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, said electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electronically commutated motor; and a motor control interface circuit directly coupled to said electronically commutated motor and coupled to said controller interface circuit, said motor control interface circuit coupled to said controller interface circuit by using a serial four-wire communications cable, said motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals from said electronically commutated motor, said second transmitter circuit including a first optocoupler, and said second receiver circuit including a

second optocoupler, said first and second optocouplers configured to isolate signals between said motor control interface circuit and said electronically commutated motor, and said electrical interface circuit configured to interrogate said electronically commutated motor to acquire status and diagnostic information."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 54. Specifically, none of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, the controller coupled via the electrical interface circuit to a microcontroller located within an electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal. Bessler et al. further describe monitoring, by the microprocessor, a cyclic parameter of the temperature signal to generate a motor control signal. Bessler et al. also describe providing the control signal via a line to an ECM. Accordingly, Bessler does not describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Alford describes providing, by an interface, enable, heating and rate signals to an ECM in response to conventional fan, heat, valve and airflow signals from a thermostat. Accordingly, Alford does not describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Kliman et al. describe acquiring, by a monitoring unit, data signals from a Stimulus and Measurement Instrumentation unit, which in turn captures signals from sensors that are in contact with a motor. Accordingly, Kliman et al. does not describe or suggest the controller coupled via the electrical interface circuit to a microcontroller located within an electronically commutated motor, where the electrical interface circuit is configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit as recited in Claim 54. For the reasons set forth above, Claim 54 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 55-57 depend from independent Claim 54. When the recitations of Claims 55-57 are considered in combination with the recitations of Claim 54, Applicants submit that

dependent Claims 55-57 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 58 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising "a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, said electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, said controller coupled via said electrical interface circuit to a microcontroller located within an electronically commutated motor; and a motor control interface circuit directly coupled to said electronically commutated motor and coupled to said controller interface circuit, said motor control interface circuit coupled to said controller interface circuit by using a digital wireless interface, said motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals from said electronically commutated motor, said second transmitter circuit including a first optocoupler, said second receiver circuit including a second optocoupler, said first and second optocouplers configured to isolate signals between said motor control interface circuit and said electronically commutated motor, and said electrical interface circuit configured to interrogate said electronically commutated motor to acquire status and diagnostic information."

None of Bessler et al., Alford, or Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 58. Specifically, none of Bessler et al., Alford, or Kliman et al., alone or in combination, describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal, the controller coupled via the electrical interface circuit to a microcontroller located within an electronically commutated motor. Rather, Bessler et al. describe receiving, by a microprocessor, a temperature signal. Bessler et al. further describe monitoring, by the microprocessor, a cyclic parameter of the temperature signal to generate a motor control signal. Bessler et al. also describe providing the control signal via a line to an ECM. Accordingly, Bessler does not describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Alford describes providing, by an interface, enable, heating and rate signals to an ECM in response to conventional fan, heat, valve and airflow signals from a thermostat.

Accordingly, Alford does not describe or suggest the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal. Kliman et al. describe acquiring, by a monitoring unit, data signals from a Stimulus and Measurement Instrumentation unit, which in turn captures signals from sensors that are in contact with a motor. Accordingly, Kliman et al. does not describe or suggest the controller coupled via the electrical interface circuit to a microcontroller located within an electronically commutated motor, the electrical interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal,. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests the electrical interface circuit as recited in Claim 58. For the reasons set forth above, Claim 58 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

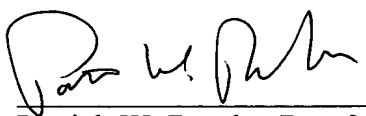
Claims 59-60 and 62-65 depend from independent Claim 54. When the recitations of Claims 59-60 and 62-65 are considered in combination with the recitations of Claim 58, Applicants submit that dependent Claims 59-60 and 62-65 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 be withdrawn.

Newly added Claim 66 depends indirectly from independent Claim 1, which is submitted to be in condition for allowance and is patentable over the cited art. For at least the reasons set forth above, Applicants respectfully submit that Claim 66 is also patentable over the cited art.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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